What is claimed is:

1. A method of forming an optical device, comprising:

forming a patterned photoresist layer over a crystalline silicon layer; and

implanting silicon into said crystalline silicon layer to form a selectively-amorphized silicon layer.

2. The method of claim 1, further comprising

removing said photoresist layer, and

forming a waveguide feature in one or more of said crystalline silicon layer and said selectively-amorphized silicon layer.

3. The method of claim 1, further comprising

forming a hard mask layer over said crystalline silicon layer before applying said photoresist layer; and

patterning said hard mask layer.

4. The method of claim 3, wherein said patterning said hard mask layer comprises dry etching said hard mask layer.

5. The method of claim 4, wherein said dry etch process comprises the use of a compound selected from the group consisting of carbon tetrafluoride, trifluoromethane, argon, and combinations thereof.

6. The method of claim 3, wherein said hard mask layer is selected from silicon oxide, silicon nitride, and combinations thereof.

7. The method of claim 1, wherein said implanting silicon into said crystalline silicon layer is performed prior to forming a waveguide feature in said crystalline silicon layer.

8. The method of claim 1, wherein said forming a patterned photoresist layer comprises applying a photoresist material over said crystalline silicon layer and patterning said photoresist material.

9. The method of claim 8, wherein said patterning said photoresist comprises a photolithography process.

10. The method of claim 1, wherein said implanting comprises high energy implantation.

11. The method of claim 1, further comprising implanting a material selected from the group consisting of boron, phosphorous, and combinations thereof subsequent to said silicon implantation to provide a relatively small change in an index of refraction contrast.

12. The method of claim 1, wherein said crystalline silicon layer is formed over an insulator layer.

13. The method of claim 12, wherein said insulator layer comprises silicon dioxide.

14. The method of claim 1, wherein the difference in index of refraction between the crystalline silicon and the selectively-amorphized silicon is in a range of about 0.24 to about 0.27.

15. A method of forming an optical waveguide, comprising:

forming a patterned photoresist layer over a crystalline silicon layer;

implanting silicon into said crystalline silicon layer to form a crystalline layer comprising regions of amorphized silicon;

removing said photoresist layer; and

forming a waveguide feature in said crystalline layer comprising regions of amorphized silicon.

16. The method of claim 15, wherein the difference in index of refraction between the crystalline silicon and the selectively-amorphized silicon is in a range of about 0.24 to about 0.27.

17. A method of forming an optical waveguide, comprising:

forming a hard mask layer comprising silicon dioxide over a crystalline silicon layer;

forming a patterned photoresist layer over said hard mask layer and said crystalline silicon layer;

patterning said hard mask layer;

implanting silicon into said crystalline silicon layer by a high energy implantation

process to form a selectively-amorphized silicon layer;

removing said patterned photoresist layer;

removing the patterned hard mask layer; and

forming a waveguide feature in said selectively-amorphized silicon layer.

18. The method of claim 17, further comprising implanting a material selected from the group consisting of boron, phosphorous, and combinations thereof subsequent to said silicon implantation to provide a relatively small change in an index of refraction contrast.